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Photon Correlation Spectroscopy of Polymers in the Glassy State
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Concentration Effects and Thermodynamic Nonideality in Gel Chromatography
T. Bleha, T. Spychaj, R. Vondra, and D. Berek 1903

An Analysis of the Reflective Component of Small-Angle X-Ray Scattering Patterns from Crazed Polystyrene
P. A. Westbrook, J. F. Fellers, M. Cakmak, J. S. Lin, and R. W. Hendricks 1913

Microstructure Rearrangement During the Heat-Treatment of Melt-Drawn Poly(ethylene Terephthalate) Fibers
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Morphology of Poly(*p*-Phenylene Terephthalamide) Fibers
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The Use of Model Networks with Reptating Chains to Study Extraction Efficiencies
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A Fluorescence Polarization Study of the Effect of Matrix Molecular Weight on the Relaxation of a Labeled Molecule in a Stretched Polymer Melt
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Polymer-Polymer Interaction Parameters of Polystyrene and Polybutadiene from Studies in Solutions of Toluene or Tetrahydrofuran
V. Narasimhan, R. Y. M. Huang, and C. M. Burns 1993

Cage Effects in Recombination of Allyl Radicals in Irradiated Polyethylene. II. Cumulative Reaction Rates and Decay Kinetic Processes
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